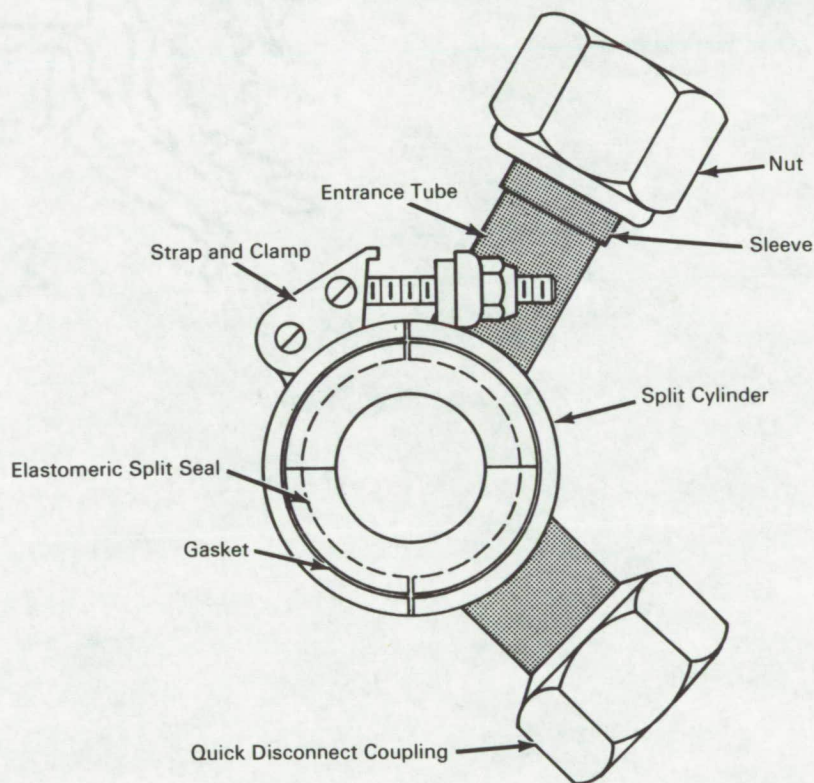


# NASA TECH BRIEF



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## Vacuum Test Fixture Improves Leakage Rate Measurements



### The problem:

To improve leakage rate measurements of individual connections, brazed joints, and entrance ports used in closed fluid flow line systems. Present probe and bell jar methods are capable of leakage rate measurements on the order of  $10^{-5}$  cc/s; a capability of  $10^{-6}$  cc/s is desirable.

### The solution:

A vacuum test fixture that is essentially a cylindrical chamber, consisting of two matching halves.

### How it's done:

The test fixture is open ended permitting it to be fitted over various sized pipe or flow lines. A strap and clamp arrangement, near both ends of the fixture, holds the halves of the fixture together until the chamber is sufficiently evacuated and the atmospheric pressure provides the needed holding force. The fixture is closed at both ends by elastomeric split seals, which are made in various sizes to accommodate variable pipe and flow line diameters.

(continued overleaf)

The entrance tube provides a port for evacuating the chamber and permits the leakage rate measurement to be made. Upon evacuation, the elastomeric split seals are forced inward, effectively sealing the chamber.

The coupling quick disconnect port is normally closed during the evacuation and leakage rate measurement. At the end of the test, the coupling quick disconnect port is opened to reduce the vacuum quickly and to enable the test fixture to be removed.

**Notes:**

1. The quick disconnect port and the entrance tube are both fastened to the same half cylinder by induction brazing.
2. The strap and clamp are not required because the two halves of the test fixture can be held together

by hand until the chamber has been sufficiently evacuated, permitting the atmospheric pressure to hold the two halves of the chamber together.

3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer  
Manned Spacecraft Center  
Houston, Texas 77058  
Reference: B66-10286

**Patent status:**

No patent action is contemplated by NASA.

Source: Harry Marx and Henry Maier  
of Grumman Aircraft Corp.  
under contract to  
Manned Spacecraft Center  
(MSC-271)